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A. A. BRENEMAN, 97 Water St., New York.

ABSTRACTS.

GENERAL AND INORGANIC CHEMISTRY.

Curious Association of Hydrocarbons with Rock Salt in Nature. F. M. Lyte.

The frequent association of salt and bitumen or petroleum in the same deposits, has often struck me as likely to lead to the development of some probable theory as to the formation of these hydrocarbons.

Almost all specimens of rock salt, when struck or rubbed, give off more or less the characteristic odor of bitumen. Beds of rock salt are often colored brown by the bitumen they contain, and petroleum, on its emergence is nearly always associated with brine.

Deposits of rock salt are, as a rule, dry and anhydrous, though salt itself has a considerable attraction for moisture.

But more than this, those salts of potassium and magnesium, often occurring with it, are still more greedy of water.

If the seemingly probable theory that all formations of rock salt are due to the evaporation of sea water be correct, then these deliquescent and hygrometric chlorides would almost always have been the last part deposited in every bed of rock salt, and though owing to their great solubility, they may have been denuded and washed or melted away perhaps long afterwards, it is probable that they generally formed the final layer at first. These would, by their affinity for water, both during their formation and subsequently, tend to withdraw that liquid from all surrounding substances.

Now, most organic matter may be looked upon as a hydrocarbon combined with the elements of water. Withdraw the water and the hydrocarbon remains.

Metallic iron, if present, might modify the reaction. Is it not, then, a probable theory that most natural deposits of hydrocarbons

owe their origin to this absorption of water, acting through the lapse of ages on organic matter, often aided by heat and pressure? If such be admitted it would account for the frequent association of salt with hydrocarbons. (*Chem. News*, **58**, *87*.) W. P. M.

On a few Crystallized Seleniates. L. MICHEL.

The author has realized the preparations of several seleniates by the dry process and by double decomposition.

The chloride of the metal to be combined with selenic acid is melted with sodium seleniate; the melted mass is cooled slowly and then treated with water.

Barium Seleniate.—If to the mixture of sodium seleniate and barium chloride some sodium chloride is added large crystals are obtained. The sp. gr. is 4.45. The crystals are insoluble in water and in cold and strong nitric acid. HCl dissolves them when warm with evolution of Cl. The analysis gives:

S_2O_3	45.23
(BaO)	54.42 *
	99.65

The crystals are rectangular octaedra, belonging to the system of the right prism with rhomboidal base; the optical properties observed were similar to those of the natural barytine. (*Bul. Soc. Chim.*, **49**, *29*.) M. L.

On a New Oxacid of Sulphur. M. VILLIERS.

The author has studied the compounds resulting from the action of SO_2 on the hyposulphites and describes one of these compounds in this paper; the others he proposes to study later.

A current of SO_2 is made to pass into a flask containing crystals of sodium hyposulphite with a small portion of water cooled by ice water; the gas is passed till no absorption occurs. If crystals remain undissolved more water is added and the current of SO_2 kept up. The liquid is allowed to stand two or three days, and then it absorbs SO_2 again. The liquid is evaporated in vacuo and the crystals formed correspond to the composition S_4O_8Na. *

* O=8.

Dissolved in water they become $S_4O_8NaH_2O_2$. (*Bul. Soc. Chim.*, **49**, *671.*) M. L.

Preparation of Hydriodic Acid. A. ETARD.

The author describes an apparatus by which iodine can be introduced by fractions into a mixture of phosphorus and water. It consists of a small glass balloon having the neck bent and joined to a bent tube passing through the cork of a large balloon in which the reaction occurs: The joint between the tube and the neck of the iodine reservoir is a rubber ring; rotation of the iodine vessel permits the haloid to fall into the water. According to Lothar Meyer the production of PH_4I, together with HI, is prevented by introducing the phosphorus into the water mixed with iodine in excess. In the latter case the phosphorus must be placed in the rotating flask. (*Bul. Soc. Chim.*, **49**, *743.*) M. L.

On a New Double Carbonate of Potassium and Sodium. L. HUGOUNENG and J. MOREL.

The authors have obtained a new salt by evaporating slowly at 12° or 15° a solution of sodium carbonate containing potassium carbonate, in presence of an excess of potassium iodide mixed with sodium phosphate and sodium chloride. The mother liquor taken during crystallization contained per litre:

Potassium iodide	495.86 grms.
Potassium carbonate	10.34 "
Sodium carbonate	177.30
Disodic phosphate	42.00 "
Sodium chloride	58.30 "

The analysis of the crystals produced answers to the formula,

$$CO_3KNa.6H_2O+CO_3Na_26H_2O.$$

Crystallographic determinations are given. (*Bul. Soc. Chim.* **49**, *740.*) M. L.

On the Toxic Character of Bismuth. DALCHÉ AND VILLEJEAN.

The authors state that bismuth although given in large quantities has never been observed to be toxic, but they assume that it is because the metal is not absorbed.

They have secured itsabsorption by hypodermic injection and have observed phenomena similar to those of mercurial poisoning, *e.g.* abundant salivation, disturbance of the renal functions, the urine becoming black and depositing a sediment containing bismuth; there is also development of enteritis with diarrhœa.

Bismuth applied upon wounds produces similar effects. (*Arch. de Pharm.*, **2**, *56.*) M. L.

Influence of Temperature on the Composition of Hydrated Calcium Sulphate. W. A. SHENSTONE and J. T. CUNDALL.

Both in dry and moist air, this salt is less stable than has been supposed. Experiment shows that the rate of dissociation is a slow one, but that it is much slower in its earlier stages than afterwards. One specimen of powdered selenite heated to 100° C. lost only .07% in weight at the end of 6 hours; beyond that time, however, the rate of loss was very greatly increased.

The experiments did not afford support to the idea that hydrates of calcium sulphate exist other than $CaSO_4 . 2H_2O$. (*J. Chem. Soc.*, **53**, *544.*) W. P. M.

Electrolytic Method of Liquefying Gases. H. N. WARREN.

A glass combustion bent at right angles, closed at each end, and having platinum plates fused into one extremity, is used. For the preparation of liquid HCl, for instance, a strong solution of the acid is introduced into the plate end of the tube, and the remaining limb is plunged into freezing mixture. Upon connection with a battery, the evolved gas liquefies in the cool end. (*Chem. News*, **58**, *127.*) W. P. M.

On a Fermentable Carbohydrate. E. GRIMAUX.

The author had in view the application of the Gorup-Besanez process of oxidation of mannite to glycerine by platinum black, with the purpose of obtaining glycerine aldehyde, $C_3H_6O_3$, and its transformation into a fermentable glucose, or even to attempt its direct fermentation. His conclusions are: that oxidized gly-

cerine gives glyceric aldehyde susceptible of alcoholic fermentation. He insists, 1st, that it is the first example of the synthesis of a fermentable sugar, having the same general reactions as glucoses, and 2d, that the definition of fermentable sugar must be modified, as they are not necessarily hydrates of carbon, containing C_6 or C_{12}. (*Bul. Soc. Chim.*, **49**, *251.*) M. L.

ABSTRACTS.

ORGANIC CHEMISTRY.

On the Sugars of Hesperidine and Isohesperidine. C. TANRET.

The author has found in the peel of bitter orange, besides hesperidine, another crystallized principle having 5 more mols. of water, which he calls isohesperidine. The object of this note is the study of the sugars yielded by the decomposition of these two glucosides. These glucosides give by decomposition a mixture of glucose and isodulcite in the proportion of 2:1. The quantity of sugar yielded was from 50 to 55 per cent. of the glucoside employed. The other product of decomposition, the so-called *hesperitine* has the formula $C_{32}H_{14}O_{12}$, (Hoffmann, Tiermann, Will), and the hesperetine of the two above cited glucosides melts at 222°. The author, finding that the decomposition is produced with fixation of water, proposes to change the formula of these glucosides. Instead of $C_{44}H_{26}O_{24}$ it would be $C_{100}H_{60}O_{54}$ (hesperidine) $C_{100}H_{60}O_{54}(H_2O_2)_5$ (isohesperidine,) and the equation of decomposition is

$$\underset{\text{hesperidine}}{C_{100}H_{60}O_{54}} + 3H_2O_2 = \underset{\substack{\text{hesperetine}\\ C_{12}H_{14}O_{12}\\ \text{isodulcite.}}}{(C_{32}H_{14}O_{12})_2} + \underset{\text{glucose}}{(C_{12}H_{12}O_{12})_2} + *$$

(*Bul. Soc. Chim.*, **49**, *23.*) M. L.

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* O=8.

Researches on the Optical Isomeres of Cinchonine. E. JUNGFLEISCH and F. LEGER.

The authors recall the experiments of Pasteur in 1853 on the optical transformation of cinchonine into quinine by heat, for which fact the explanation was that these bodies must have a complete molecule formed by two active bodies, one of which rotates light to the right the other a little to the left; the result of the heating is to make one of the groups predominate, the other having been made inactive under the given conditions. The authors had in view the study of the great number of isomeres of the alkaloids of cinchona bark, Pasteur having only indicated one isomere for each group of alkaloid. They publish now their results on cinchonine.

This alkaloid was boiled with a solution of four parts of H_2SO_4, diluted with its weight of water, for 48 hours at 120°. The processes used for the separation of the alkaloid are too long to be described here. The bases separated and studied are:

1. *Cinchonibine*, $C_{38}H_{22}N_2O_2$. Insol. in ether, crystallizing in boiling alcohol; $\alpha D = +75°8$, in alcoholic solution of 0.75%.

2. *Chinchonifine*, $C_{38}H_{22}N_2O_2$. Insol. in ether, crystalling from boiling alcohol in needles, forming a very soluble succinate, $\alpha D = +195_0$, in alcoholic sol. of 0.75%.

3. *Cinchonigine*, $C_{38}H_{22}N_2O_2$. Sol. in ether, tne hydrochloride very sparingly soluble in the cold, and crystallizing very well. $\alpha D = -60°1$ in alcoholic sol. of 1%.

4. *Cinchoniline*, $C_{38}H_{22}N_2O_2$. Sol. in ether, the hydrochloride in very large crystals, very soluble, the dihydriodide insoluble. $\alpha D = +53°2$ in alcoholic sol. of 1%.

The authors have found also two bases of another group:

5. *Oxycinchonine*, α $C_{38}H_{22}N_2O_4$. Insol. in ether, soluble in dilute alcohol; forming very sparingly soluble hydracid salts. $\alpha D = +182.56$ in alcoholic sol. of 1%.

6. *Oxycinchonine*, β $C_{38}H_{22}N_2O_4$. Insol. in ether, soluble in dilute alcohol, forming very soluble hydracid salts and a succinate very little soluble in cold. $\alpha D = +187.14$ in alcoholic sol. of 1%.

The separation of these products is described at length. (*Bul. Soc. Chim.*, **49**, *743*.) M. L.

Preparation of Tetraphenylethylene. P. DE BOISSIEU.

Dry distillation of diphenylmethane yields the above substance. The diphenylmethane, prepared by the action of benzyl chloride on benzol in presence of aluminum chloride is introduced into a balloon with a reflux condenser. The balloon carries a bromine funnel, and the bromine enters drop by drop. The operation goes on at about 150° ; when all the bromine has been added the temperature is raised to the boiling point, and kept till HBr is all driven off. The contents of the flask are introduced into a retort and distilled. The substance passing over above 360° has the properties of tetraphenylethylene as given by M. A. Behr. Nascent converts it into tetraphenylethane, whereas oxidation by chromic acid yields benzopinacone, $(C_6H_5)_2{=}\overset{|}{C}OH$, and then

$$(C_6H_5)_2{=}\overset{|}{C}OH$$

benzophenone. (*Bul. Soc. Chim.*, **49**, *681.*) M. L.

Preparation of Isoproprylacetrylenol with Methyl-isopropyl carbonyl. A. BEHAL.

The author had in view the study of the place of H taken by substitution in ethylene bromide, iodide or chloride. Two cases are to be considered. 1st. The bisubstituted body corresponds to an acetone, and has, near by, a tertiary carbon :

$$\begin{matrix} R \\ R \end{matrix}\!\!>\!CH-CCl_2-CH_3$$

2d. The derivative is such that one of the haloids is attached to a tertiary carbon, the other to a C group retaining one H :

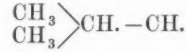
$$\begin{matrix} R \\ R \end{matrix}\!\!>\!\overset{|}{C}-\underset{|}{CH}-CH_3 \qquad (Br-Br)$$

The author considers the first case. He has taken methyl-isopropyl carbonyl

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!CH-CO-CH_3$$

of which he indicates the preparation by the action of isobutyryl chloride on zinc methyl; the acetone obtained boils at 93–96°. This

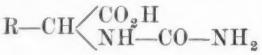
body is treated with phosphorus perchloride, and the chloro-compound treated in sealed tubes with alcoholic potash. The properties of the body lead to the formula



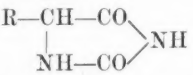
(*Bul. Soc. Chim.*, **49**, *23*.) M. L.

On the Metapyrazolones of Pinner and Lifschutz. E. GRIMAUX.

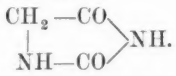
MM. Pinner and Lifschütz have given the name of metapyrazolones to the bodies produced by the action of HCl on the combinations of urea with the cyanhydrines of aldehydes. According to those authors there would be formed the acid



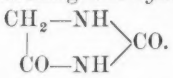
which acid losing water will give



R being an hydrocarbon radical, these bodies would be substituted products of metapyrazolone.



The authors, says M. Grimaux, thought that they had discovered a new function, for which they created a name. The pretended metapyrazolone is nothing but *hydantoine* or *glycolylurea*.



In the same way the author denies the necessity of accepting the name of metapyrazols, isomeres of metapyrazolones. (*Bul. Soc. Chim.*, **49**, *739*.) M. L.

Researches on Sulfines. G. PATEIN.

The author describes the preparation of these bodies by mixture of the theoretical quantities of the alcoholic sulphide and iodide;

the reaction is complete after two or three days without heating. The author has prepared—1. $(CH_3)_3$ SI. 2. $(C_2H_5)_3SI$.

3. $\left.\begin{matrix}(C_2H_5)_2\\(CH_3)\end{matrix}\right\}$ SI. 4. $\left.\begin{matrix}(CH_3)_2\\(C_2H_5)\end{matrix}\right\}$ SI.

He has also prepared these bodies by another reaction, that of an alcoholic iodide on an alcoholic solution of sodium sulphide. He thinks that the reaction occurs thus: $3(CH_3)I+Na_2S=2\ NaI+(CH_3)_3SI$. $2(CH_3)_3SI+Na_2S=2NaI+3(CH_3)_2S$. By the reaction of these iodides of sulfines with silver cyanide he obtains the sulfine cyanines $(C_2H_5)_3SCN$. AgCN; $CH_3(C_2H_5)_2$ SCN. AgCN and the methyl compounds and ethyl-methyl compounds of identical composition. (*Bul. Soc. Chim.*, **49**, *678.*) M. L.

Hydration of Tolane. A. Behal.

Tolane or diphenylacetyn is, like phenanthrene, isomeric with anthracene. It answers to the composition $C_6H_5.C{=}C.C_6H_5$. The author has studied its hydration by means of sulphuric acid, with the intention of extending the reaction to the aromatic series. He describes his method as follows: The substance after distillation in a current of steam and crystallization from alcohol appears in lamellae, melting at 54–55°. The melting point compared with the analysis points to the presence of desoxybenzoin, that is an acetone phenylbenzyl carbonyl, $C_6H_5CO—CH_2C_6H_5$. (*Bul. Soc. Chim.*, **49**, *337.*) M. L.

Action of Sulphuric Acid on Cinchonine in Presence of Oxalic Acid. E. Caventon and Ch. Girard.

When cinchonine is submitted for several days to the action of oxalic acid in presence of H_2SO_4 between 125° and 130° the alkaloid is modified. The solution is precipitated by NH_3, and the precipitate treated by ether, which dissolves only a portion of it. The ethereal solution is agitated with acidulated water, the aqueous solution is precipitated by NH_3 and the precipitate is treated with benzole. The authors describe one of the two bases soluble in ether and benzol. It is also soluble in

acetone, chloroform, methyl, ethyl and amyl alcohols; it fuses at 125°, turns the plane of polarized light to the left, is sparingly soluble in water, and does not seem to be altered by ebullition. Heated with potash it gives compound ammonias, quinoleic and pyridic derivatives. It forms with HCl a well crystallized salt, soluble in water; with platinic chloride it gives a fine orange yellow precipitate. The composition is similar to that of cinchonine. (*Bul. Soc. Chim.*, **49**, *88.*) M. L.

Chemical Actions of some Micro-organisms. R. WARINGTON.

The action of twenty-seven varieties has been studied in four particulars:

1. The hydrolysis of urea.
2. Action on milk.
3. Capacity for reducing nitrates.
4. Power of producing nitrification.

The article is a long and full one. (*J. Chem. Soc.*, **53**, *727.*) W. P. M.

ABSTRACTS.

ANALYTICAL CHEMISTRY.

Two New Methods for Estimation of Sulphur in Steel. J. O. ARNOLD and H. J. HARDY.

The first is intended for rapid (less than thirty minutes) and approximate determinations (error .01 to .03 per cent.) suited to quick, rough work, and consists in treating the borings with zinc and sulphuric acid (see cut in original article), absorbing the evolved H_2S in solution of NaHO, adding lead acetate and comparing the resulting coloration with one of known strength.

In the second method (which is of much greater accuracy) the borings are treated with sulphuric acid as before, but hydrogen is

supplied from a gas holder. The gases pass through a series of small test-tube-like vessels of special arrangement, each containing an amount of lead acetate solution sufficient to fix as sulphide .01% of S. in 2 grms. of steel. The reaction is self indicating. All that is required is to count the number of precipitated cylinders and estimate roughly the faint color in the last tube acted upon.

The article is fully illustrated. (*Chem. News*, **58**, *41.*)

W. P. M.

Notes on the Manufacture of Chlorine, with Special Reference to the use of Magnesia in that Process, and its Economy. C. T. KINGZETT.

The chemical reactions that are concerned in the Weldon-Pechiney process are experimentally investigated and found to be:

1. $H_2O+MgCl_2=MgO+2HCl$
   $2HCl+O=H_2O+Cl_2$
2. $MgCl_2+O=MgO+Cl_2$

The decomposition of HCl vapor at a red heat by means of air is promoted by the presence of free magnesia. The author experimentally shows the possibility of using a constant and limited quantity of magnesia with a view of manufacturing chlorine from successive quantities of hydrochloric acid. He suggests the use of a substance such as brick or pumice stone, which has been previously coated or admixed with MgO or some magnesium salt, thus disposing of the great quantities of solid material handled in the Weldon-Pechiney process. (*J. Soc. Chem. Ind.*, **7**, *286.*)

W. P. M.

Estimation of Nitrites, alone or in presence of Nitrates and Chlorides. T. CUTHBERT DAY.

The solution containing the nitrite is introduced into a flask of about 75 c.c. capacity and an excess of solid NH_4Cl added until the solution is *thoroughly* saturated.

From a suitable apparatus, pure CO_2 is passed into the flask until the atmosphere therein is entirely displaced. The contents of the flask are then boiled, and the evolved gases (CO_2 and N) pass by a delivery tube into a graduated absorption tube inverted over a

mercury bath, and containing mercury and a few c.c. of strong KHO solution. After complete reaction, the absorption tube is removed to a vessel full of water, the mercury allowed to fall out, and the volume of residual nitrogen measured after standing a few hours.

From the following equation it will be seen that the volume of nitrogen obtained must be *halved* in order to calculate the quantity of nitrite originally present :

$$KNO_2 + NH_4Cl = KCl + 2H_2O + N_2.$$

The presence of a nitrate does not affect the accuracy of the determination. (*J. Chem. Soc.*, **53**, *422.*) W. P. M.

Photochemical Estimation of Graded Tint. E. J. Mills and J. Buchanan.

Attention has been directed to the comparison of tinctorial effect upon dyed goods. The process consists in photographing on an isochromatic plate, and at one operation, equal sized pieces of tissue, exhibiting different degrees of the same tint. A negative is thus obtained from which any number of prints can be produced on "gelatino-bromide" paper, and each impression represents definitely in terms of silver, the original grade of tint. All that is necessary is to make a sufficient number of impressions to enable the silver to be determined either volumetrically or gravimetrically. (*J. Soc. Chem. Ind.*, **7**, *309.*)

W. P. M.

Adulteration of Tallow with Cottonseed Oil. Rowland Williams.

The author shows that as much as 40 per cent. of the adulterant may be added without fear of detection by ordinary observation, and that determinations of the melting point and saponification equivalent are worthless, unless taken in conjunction with other data.

The equivalent of iodine absorption is, however, so different for tallow and cottonseed oil, that the author recommends it as a means of detecting admixture.

A five per cent. addition of cottonseed oil is readily noted. (*J. Soc. Chem. Ind.*, **7**, *186.*) W. P. M.

Detections of Falsification in Butter. P. Bockairy.

The process is based upon the difference in quantities of alcohol necessary to precipitate the fatty matter, butter or other fat, in solution in crystallizable benzol. Of all fats examined pure butter is the one requiring the largest amount of alcohol before giving any precipitate. The author observes also the volume of the fatty matter precipitated, its physical appearance, etc., these appearances being different for every kind of fat observed by him. (*Bul. Soc. Chim.*, **49**, *247.*) M. L.

Alcoholic Silver Nitrate as a Reagent for Acetylene Hydrocarbons. A. Behal.

The author has found that the two reagents employed to characterize anacetylene hydrocarbons, viz., ammoniacal cupric chloride and ammoniacal silver nitrate, do not always indicate the presence of these even when abundant in a mixture. A proportion of 20 per cent. of œnanthylidene was not detected by silver nitrate, and a proportion of 10 per cent. was only doubtfully indicated by the cupric chloride. The author thinks that he has found a better reagent in an alcohol at 95° saturated with silver nitrate (the ammoniacal alcoholic solution does not give good results). He has observed precipitations with acetylene, allylene, œnanthylidene, caprylidene, dipropargyl, but not with the substituted acetylene hydrocarbons, ethylpropylacetylene, caprylidene of caprylene, or tolane. (*Bul. Soc. Chim.*, **49**, *335.*) M. L.

Determination of Starch in the Potato. A. Girard.

The author's researches have led him to conclude that 1 grain of starch of potato distended by certain reagents can absorb 0.122 iodine. On this fact he bases his process of determination. About two kilogs. of potatoesare taken in slices of 300 or 400 grms., grated, and 25 grms. of the pulp are placed in a 750 c.c. flask with 50 c.c. of HCl of $\frac{2}{1000}$ and left in contact for three hours. An ammoniacal solution of copper oxide is then added in the proportion of 100 c.c. and the solutions are left together over night ; the next day the solution is treated with excess of acetic acid. The iodine

solution is made with 3.05 grms. c.p. iodine and 4 gr. c.p. KI, 10 c.c. answer to 0.25 grms. starch. The operation is at end when a drop of the solution stains starch paper.

It is necessary to make a correction of 0.5 per cent. for albuminoid bodies. (*C. R., 1887,* **104,** *1629.*) M. L.

Detection of Saccharin in Beer. A. H. Allen.

Concentrate the beer to one-third. Agitate with ether. Evaporate the ethereal solution to dryness. Ignite the residue with caustic or carbonated alkali, also adding a little nitre. A sulphate will be formed by the ignition, which, of course, will give the usual precipitate with barium chloride. The weight of Ba SO_4 precipitated, multiplied by .785 will give the weight of saccharin to which it corresponds. The concentrated beer should react acid before agitating with ether, therefore, if necessary, add a little phosphoric acid. (*Analyst,* **13,** *105.*) W. P. M.

New Process for the Medico-Legal Detection of Blood. M. Terry de la Bellone.

The suspected spots are put in contact with a $\frac{1}{1000}$ solution of NaCl, and the solution (after contact with the spots for several hours) is examined with the spectroscope for a haemoglobine. The solution is then treated with a few drops of a concentrated sol. of chloral. If a precipitate forms, a portion is taken on a piece of glass and coagulated by slight heat ; the liquid that separates is removed with filtering paper. The coagulum is treated with a sol. of fuchsine, washed with water to take away the excess of fuchsine, treated with a drop of acetic acid, covered with a slide and the blood globules are examined under the microscope. The author indicates modifications of the process for blood stains on wood, iron, earth, etc. (*Arch. de Pharm.,* **3,** *115.*) M. L.

Spectroscopic Detection of Blood. G. Lucossier.

The author asserts that it is not the oxyhaemoglobine that give the most sensitive spectral reaction, but the reduced hematine (haemochromogene of Hoppe-Seyler). In other words, if an oxy-

haemoglobine solution will not give any absorption of light, the same solution will give a very distinct spectral reaction by being transformed into reduced haematine.

1. The blood spot is dissolved in water and oxyhaemoglobine is looked for with the spectroscope.

2. The solution is mixed with one drop of a fresh sol. of sodium hydrosulphite, which dispels the spectrum of oxyhaemoglobine.

3. One or two drops of a concentrated sol. of soda are added, haemoglobine break into globuline and reduced haematine. The author indicates as the spectral characteristics of the haematine, disappearance of the bands by heating to 50°, etc., etc. (*Bul. Soc. Chim.*, **49**, *691.*) M. L.

ABSTRACTS.

INDUSTRIAL CHEMISTRY.

Experiments on the Industrial Value of Thompson's Calorimeter. M. SCHEURER-KESTNER.

The apparatus is used in England for the determination of the heat of combustion of coal, etc., the matter being mixed with eight or ten times its weight of a mixture of potassium chlorate and potassium nitrate. The author finds that this quantity of oxidizing agent is too small and he employs from 11 to 14 times the weight of the combustible. The author compared this instrument with the calorimeter of Fabre and Silbermann, employing charcoal, and the result is that the figures obtained with Thompson's instrument must be increased by 15 per cent. Applying this correction the instrument gives sufficiently good results. With practice the error does not reach 1 per cent., although the results cannot be absolutely depended upon, the author having met anomalies in results that he is at a loss to explain. (*Bul. Soc. Chim.*, **49**, *685.*) M. L.

Rate at which Bleaching Powder loses its Available Chlorine. JOHN PATTINSON.

Samples of the same powder were kept at the several temperatures of 60°, 70° and 80° F. and were analyzed monthly for a period of twelve months. The original samples contained 36.10 per cent. available chlorine. At the end of a year the results were :

	Original.	60°.	70°.	80°.
Available Chlorine	36.10	30.10	28.30	19.10
Chlorine as Chloride	0.14	5.37	6.91	15.17
Total Chlorine	36.33	35.47	35.64	35.64

Thus the available chlorine disappears in proportion to the length of time the powder is kept, and to the degree of temperature. The total chlorine remaining nearly constant, the change is probably :

$$CaOCl_2 = CaCl_2 + O.$$

(*J. Soc. Chem. Ind.*, **7**, *188.*) W. P. M.

Recovery of Sulphur from Alkali Waste. A. M. CHANCE.

The mixture of alkali waste and water, of the consistency of thin cream, is placed in a series of vessels (see illustration in original article) and lime kiln gases (CO_2 and N) then forced through.

Calcium sulphide is broken up by the CO_2, with liberation of H_2S, which passes on to the next vessel, where it meets with a further quantity of alkali waste, and is absorbed with production of CaH_2S_2. For a time, the gases issuing from the last vessel contain neither CO_2 nor H_2S and are allowed to escape ; but finally action commences between the CO_2 and CaH_2S_2 according to the equation :

$$CO_2 + CaH_2S_2 + H_2O = CaCO_3 + 2H_2S.$$

When H_2S is observed to issue in considerable strength from any vessel of the series, that vessel is connected directly with a gas holder and the gas collected as long as it continues of sufficient richness.

After collection, the gas may be burned directly for preparation

of sulphuric acid, or the sulphur may be itself recovered by a Claus kiln, working on the principle of incomplete combustion :

$$H_2S+O=H_2O+S.$$

The process is a continuous one, and a chief point thereof is the elimination of a considerable quantity of inert, diluent gases, mainly nitrogen, which are allowed to escape, leaving the remaining gases proportionately enriched. (*J. Soc. Chem. Ind.*, **7**, *162.*)

W. P. M.

Conversion of Lime Mud into Cement. J. S. RIGBY.

As a bye-product of the alkali manufacture, calcium carbonate (lime mud) is produced in a state of subdivision comparing favorably with the finest ground limestone. The author's method of converting this into cement, consists in first washing the mud as free from alkali as possible and mixing with a good clay, in such proportions as will give the finished amount the following composition :

Lime	62.
Alumina and iron oxide	10.
Silica	22.

The mixture is then dried and charged into kilns with alternate layers of coke.

The process is patented. (*J. Soc. Chem. Ind.*, **7**, *301.*)

W. P. M.

Effects of Food-preservatives on the Action of Diastase. HENRY LEFFMAN and WILLIAM BEAM.

One-half c. c. maltine, diluted to 5. c. c. and added to 100. c. c. starch solution was the liquid used in following table :

Antiseptic used.	Proportion.	Fehling's Solution required.
None	———	245. c. c.
Salicylic acid	1 to 500	No sugar formed.
" "	1 " 1,000	" " "
" "	1 " 20,000	245 c. c.
Boric acid	1 " 1,000	245 "
Sodium acid sulphite	1 " 1,000	245 "
Saccharin	1 " 1,000	18.5 c. c.
"	1 " 500	5.6 "
Beta-napthol	1 " 1,000	204 "
"	1 " 500	174 "
Alcohol	1 " 25	245 "

EXPERIMENTS WITH DIASTASE.

Proportion of Diastase.	Antiseptic.	Proportion of Antiseptic.	Fehling's Solution required.
1 to 500	None	———	300.5 c. c.
1 " 500	Salicylic acid	1 to 3,000	286 "
1 " 500	"	1 " 1,500	16 "
1 " 500	"	1 " 1,000	No sugar.
1 " 1,000	None	———	263 c. c.
1 " 1,000	Salicylic acid	1 to 1,000	No sugar.
1 " 2,000	None	———	238 c. c.
1 " 2,000	Salicylic acid	1 to 5,000	82 "
1 " 2,000	"	1 " 3,000	No sugar.
1 " 1,000	Boric acid	1 " 1,000	250 c. c.
1 " 1,000	Sodium acid sulphite	1 " 1,000	263 "
1 " 500	Saccharin	1 " 1,000	86.3 "
1 " 1,000	"	1 " 1,000	No sugar.
1 " 1,000	Beta-napthol	1 " 1,000	238 c. c.
1 " 1,000	Alcohol	1 " 25	250 "

The inferences are that salicylic acid is especially objectionable in a malt extract, and that saccharin is also unsuitable.

Boric acid and sodium acid sulphite seem to have but little retarding effect. (*Analyst*, **13**, *103.*) W. P. M.

A New Antiseptic Soap. JOHN THOMPSON.

The soap contains 1 to 3 per cent. of biniodide of mercury, dissolved in potassic iodide. For use, the watery solution of the soap is diluted until the quantity of the salt present reaches 1 in 2,000 or 1 in 4,000.

The advantages of iodide over the chloride of mercury are, that it is not so poisonous, is a much more powerful antiseptic, and makes a good and effective combination with soap. (*J. Soc. Chem. Ind.*, **7**, *192.*) W. P. M.

Action of Petroleum on Lead. WM. FOX.

On tanks in constant use, a deposit is formed consisting of carbonate and hydrated oxide, together with a small quantity of valerate of lead.

Experiments support the probability that the white lead, of which the powder practically consists, and a paraffin, is formed

by the action of an oxidizing agent and a small quantity of valeric acid present in the petroleum. (*Chem. News*, **58**, *39*.)

W. P. M.

Note on Rave's Process for the Utilization of the Acid Tar Residues of Petroleum Manufacturers. W. P. THOMPSON.

The acid tarry material formed by refining petroleum with sulphuric acid, has, until recently, been a waste product. The *Société Oléo Graisse* are at present engaged in utilizing it by Rave's process. The acid tar is kneaded with iron cuttings or filings, the iron being in slight theoretical excess. After more or less time the acid combines as metallic sulphate. Hot water is added. The sulphate dissolves, the excess of iron falls to the bottom, and the black mass melts and rises to the surface. After thorough washing this black mass is found to possess all the mechanical proportions of the best purified soft bitumen. The solution of sulphate is drawn off and allowed to crystallize. The "bitumen" is heated in a still until it assumes almost any required degree of hardness. According to the amount of heating there may be obtained : 1. An elastic substance, strongly resembling India rubber, or 2, a material hard and tough as ebonite, which is an extremely good non-conductor of electricity, is unacted upon by acids or alkalies, and is therefore well adapted for making galvanic batteries, coating acid tanks, and the like.

Upon pushing distillation to the extreme, a bright metallic looking carbon is left which is hard enough to scratch glass and is a remarkably good conductor of electricity. (*J. Soc. Chem. Ind.*, **7**, *303*.)

W. P. M.

Abstracts of American Patents Relating to Chemistry.

(From the Official Bulletin of the U. S. Patent Office.)

March 13th, 1888.

379,298.—Preparation of quinine hydrochloride Loretta B. Weld.

Quinine sulphate and sodium chloride are dissolved in boiling alcohol, and the solution concentrated until the sodium sulphate is precipitated, the precipitate is separated and the quinine hydrochloride is crystallized.

379,487.—Obtaining ammonia and hydrochloric acid. L. Mond.

379,488.—Obtaining ammonia and chlorine from ammonium chloride. L. Mond.

379,492.—Process of distilling petroleum. W. H. Pitt.

March 20th, 1888.

379,580.—Self hardening cement. F. Jurschina.

Consists of hydraulic cement and water glass.

379,727.—Tanned skin. V. Riviére.

A skin previously tanned with vegetable tanning matter, having its pores impregnated with chromic oxide and dyed with a color partly combined with the chromic oxide as a mordant.

379,731.—Producing lithographic surfaces. H. Schoembs.

Zinc plates are subjected to the action of a mixture of nitric and sulphuric acids, and then to the action of an ammonium salt.

379,752.—Apparatus for the manufacture of soda. M. R. Wood.

379,764.—Wet process of extracting pure zinc from its ores. C. F. Croselmire.

The roasted ore is immersed in dilute acid, and an air blast passed through the solution until the impurities are oxidized, after which the zinc solution is drawn off and the zinc deposited or precipitated.

379,820.—New mercuric salt for battery fluids. A. Schanschieff.

Consists of the yellow basic mercuric sulphate combined with mercuric bisulphate.

March 27th, 1888.

380,040.—Gas washer. A. Kloenne.

380,067.—Production of new amido compounds and of azo colors produced therefrom. A. Weinberg.

The ethers of tetrazooxydiphenyl, and of tetrazooxyphenyltolyl, are combined with two equal or different molecules of an amine or of a phenol, or of a sulpho acid or carboxylic acid of an amine or a phenol.

380,098.—Coloring matter from the sulpho acids of ethyl or diphenylamine combined with tetrazodiphenyl or tetrazoditolyl. T. Diehl.

380,161.—Bath for extracting aluminium and alloying it with other metals. W. A. Baldwin.

Consists of sodium chloride, clay or other earth bearing alumina, and charcoal, the sodium chloride being in excess of the other ingredients, and the whole adapted to be fused.

380,189.—Method of destroying insects. A. Clemm.

Insects and animals injurious to vegetation are destroyed by first impregnating the ground with an alkali carbonate and alkali sulphide, and then with a dilute acid.

April 3d, 1888.

380,403.—Production of disulpho and dicarbo acids of the diamidobenzidines. L. Paul.

The tetrazo compounds of benzidine, tolidine, diamidoxylyl are combined with one or two molecules of meta- or paraamidobenzene sulpho acid, or ortho-, meta-, or paraamidobenzoic acid, or the sulpho acids of paratoluidine or xylidine in alcoholic solution.

380,524.—Process of desilverizing lead bullion. H. H. Schlapp.

380,593.—Composition of matter for preserving wood, etc. P. L. Quarante and E. Descalonne.

Consists of aluminium acetate, lead subacetate, lead pyrolignite and glycerin.

April 10th, 1888.

380,708.—Tanning process. A. Warter and H. C. Koegel.

Consists in first subjecting the depilated skin to the action of an aluminium salt, and then of a neutral chromium salt.

380,726.—Process of making hydrogen. W. Massert and G. Richter.

A mixture of zinc dust with a substance containing water in chemical combination is subjected to heat.

380,775.—Process of obtaining sodium, etc. O. M. Thowless.

Sodium or potassium is obtained by heating carbonaceous or other reducing material, gradually supplying sodium or potassium hydroxide or other suitable sodium or potassium compound thereto, and condensing the vapor evolved.

380,776.—Apparatus for obtaining sodium, etc. O. M. Thowless.

380,777.—Production of diazo coloring matters. A. F. Poirrier and Z. Roussin.

Produced by the combination of nitrodiazobenzene, nitrodiazotoluene, nitrodiazoxylene, etc., with the isomers and homologues of naphthionic acid, especially the naphthionic acid of Witt.

380,927.—Production of azo colors. A. F. Poirrier and D. A. Rosenstiehl.

Nitro-aromatic amines, particularly melanitraniline, the isomeric nitrotoluidines, melting at 107° and 78°, and nitroxylidine melting at 123°, are reduced in an alkaline medium. The polyazo derivatives of these reduction products are combined with the phenols, the oxyphenols, the naphthols, the oxynaphthols, the primary, secondary and tertiary amines, and also the alkyl, sulpho and carboxyl derivatives of all these bodies.

381,045.—Manufacture of purple black azo dyestuff. O. N. Witt.

381,046.—Purple azo dyestuff. O. N. Witt. W. R.